

**THE DIFFERENT APPROACH OF NEW PRODUCT
DEVELOPMENT PROCESS IN THAILAND'S FOOD
& BEVERAGE INDUSTRY**



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entitled
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DEVELOPMENT PROCESS IN THAILAND'S FOOD
& BEVERAGE INDUSTRY**

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THE DIFFERENT APPROACH OF NEW PRODUCT DEVELOPMENT PROCESS IN THAILAND'S FOOD AND BEVERAGE INDUSTRY

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ABSTRACT

The purpose of this study is to discover what factor(s) that influences the different approach of new product development (NPD) process in Thailand's food and beverage industry and which stage/step from each model should be adjust in order to create better quality of new product development. 5 participants from 4 companies who used to have experience in different approach were interviewed. In-depth interview is conducted to gather qualitative information about R&D's perspective of their approach for NPD process and opinion to create better process for their NPD. The general NPD process of Food and Beverage Company is similar which consist of input information, finding target quality, product development, verification, recipe development, production process and launching. However, there are three different approach of input information which is Top management, Marketing and R&D approach. Since each function has different main responsibility, these approaches create different characteristic of the new product development. In term of step/stage of the process, the input information for finding target quality and verification part are the main part to be continuous improved in order to create the best products to society.

KEY WORDS: New product development process/ Different approach/ Food and Beverage Industry/ R&D staffs

37 pages

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CHAPTER I

INTRODUCTION

Nowadays, many industries encounter with high expectation from customer's requirement. Customers need the high quality of the product during the last few decades. If the products are not fit with customer need, they would be terminated at the end. (Cagan and Vogel, 2012)

Therefore, new product development process was a crucial factor for any firm's success (Man et al., 2010) because it not only provided the appropriate products for customers, but it could also create competitive advantages which overcome other competitors. However, there were only 60% of new product development could be survived and launched into the market (Stevens and Burkey, 2003). Therefore, different process approach might create various outcomes from each firm.

Thailand's food & beverage industry was very interesting to study new product development process. Due to economic growth, most food and beverages company in Thailand had lots of new product launching (SCB Economic Intelligence Center, 2013) which they have always encountered with the learning point about their new product development process that they could provide recommendation for further improvement.

Hence, this study highlights *the different approach of new product development in Thailand's food & beverage industry* which consist of background research and problem statement.

1.1 Background research

There were many new product development models (Inan et al., 2010) which one of the general processes consisted of eight steps that are idea generation, idea screening, concept development and testing, marketing strategy, business

analysis, product development, test marketing and commercialization (Kotler and Keller, 2006)

The different firms had different product development approaches which aligned with the concept of the general processes. The developers were the one who needed to search for the suitable new product development activities and processes in order to create successful development and new product launching. (Millson, 2012)

For Thailand's food & beverage industry, the 2013 new product development survey from BNP media's market Research Division stated that around 64% of Thailand's food & beverage industry planned to launch more new products into the marketplace. (BNP media's market Research Division, 2012)

As a consequent, the different approach of new product development in Thailand's food & beverage industry would be discussed. Thus, understandings different approach of new product development processes could be selected for specific type new product development.

1.2 Problem statement

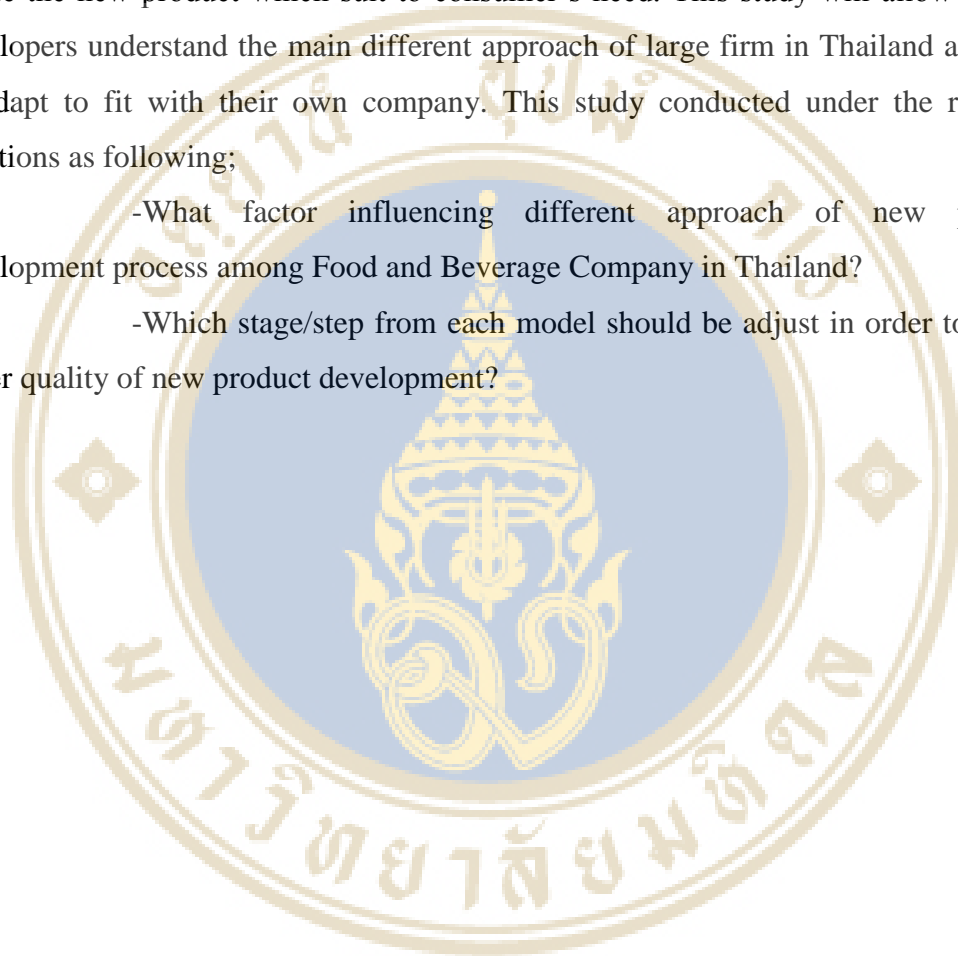
Several studied examined on general new product development model (Kotler and Keller, 2006; Inan et al., 2010) and proficiency of new product development process (Millson, 2012; Sarmad, F., 2012). The existing researches were mainly focused on risk management for new product development projects (Poranonond and Thawesaengskulthai, 2014). While some studies mentioned the factors effecting new product development process (Ernst et al., 2010; Suwannaporn and speece, 1998; Inan, 2010). Specifically, little of literatures focused on new product development process for food and beverage companies except the study of the management tools and optimizing new product development project (Man, 2010; Sarmad, F., 2012). Moreover, there was less literatures to study about new product development process for Thailand's food and beverage industries. These studies would not be best described in the different situation. Therefore, current study is aimed to examine different approach from large firm of new product development in Thailand's food and beverage industries. The dimension of new product development model,

advantages and disadvantages would be discussed. Additionally, this study pinpoints to propose the process that is suitable for each new product development.

The models from large enterprises in Thailand are needed to deeply study; why each company have different new product development approach, how difficult to implement each model, the cause of obstacles, how to eliminate some part of this model and what functions need to be improved and maintained in order to create the new product which suit to consumer's need. This study will allow several developers understand the main different approach of large firm in Thailand and how to adapt to fit with their own company. This study conducted under the research questions as following;

-What factor influencing different approach of new product development process among Food and Beverage Company in Thailand?

-Which stage/step from each model should be adjust in order to create better quality of new product development?



CHAPTER II

LITERATURE REVIEW

In this chapter, the author defined the definition and meaning of each keyword. Furthermore, frameworks which related to the theories were mentioned in this research in order to display clearly description of different approach of new product development process in Thailand's food and beverage industry. The researcher had studied and collected data and information, concept and theory which mainly divided into four points;

- New product development
- General model of new product development process
- New product development process for food and beverage industry
- New product development process for Thailand's food and beverage industry

2.1 New product development

2.1.1 Definition of new product development

New product development (NPD) defined as a state of an initiative of new market, new service together with new technology-based invention which led to the new production development, (Coenen and Kok, 2014). In the research of International Journal of Production, Salgado et al. (2012) stated that NPD is an order of activities, from idea generation to production process, which the outcome must be the new products.

In general, NPD nowadays is one of the main parts of large enterprises (Floren and Frishammar, 2012) in order to provide competitive advantage to the company. Coenen and Kok, 2014 referred to the term of NPD which leads to develop and introduce product innovation.

Additionally, Ebrahim et al. (2010) mentioned that NPD was a critical activity to develop both innovative and steady products. Moreover, their performances focused on not only introducing the new product, but also concern the quality of both new product and development process (Chiesa et al., 1996)

Apparently, NPD is a risky process because it can cost in a failure case. Therefore, determination of the dimension is the significant factor, which led to the success of NPD, can be useful for management team to select the suitable model for screening decision. (Inan et al., 2010)

2.1.2 Type of new product development

Many researchers tried to categorize new product development into various types. These types are defined by the type of market the product is entering, such as, improved product, new product with existing market, new created product and innovative product. (Olson et al., 1995; Categories of New Products (2014). From Managing Products Tutorial. KnowThis.com. Retrieved from <http://www.knowthis.com/managing-products/categories-of-new-products>). The types of innovation were categorized as follows:

1. Product improvement - Products slightly change to improve or upgrade for existing market. Products are modified to keep its uniqueness such as software updates.
2. Existing product with new market platforms - Existing products are extended into the new market segment. Existing platform can use in another application such as creative new application for Iphone.
3. New product platform - The products are expanded to another family but they are familiar markets and product categories such as Iphone 3 to Iphone 4
4. Innovative products - A new breakthrough products create entirely new market. There are very few products in this category. The example is digital music players, such as Apple's iPod. (Introduction to project management, 2011)

2.1.3 Team approach to new product development

The main department approach to new product development was divided into three teams. (Anderson,2008)

1. *Top managements* - For the research of product & brand management journal, Hanna (1995) stated that Top managements are responsible for approving development efforts in order to create new product development. They control the product idea and concept the same direction as their objective. (Yelkur and Herbig, 1996)

2. *Marketing department* - The marketing's role is to lead the new product development process. Due to as a project manager, they have to coordinate, integrate and pursue the new product idea together with provide consumer's need to technical team (Bingham, 1992)

3. *Technical department* - The technical in term of R&D and engineering had to identify and assess the target user. In addition, they needed to concern production process. It might call the feasibility study of new product. (Yelkur and Herbig, 1996)

2.2 General model of new product development process

To create new products from idea generation through the new product launching (Rothaermel and Deeds, 2004), there were many NPD process which Booz and Hamilton (1982) stated that NPD strategy was the first requirement before come up to seven NPD process that consisted of idea generation, idea screening, Concept Development and testing, Business Analysis, Prototype development, Test Marketing, Commercialization. This model was shown in figure 2.1



Figure 2.1 The flow of the seven-stage new product process model

Sources: Adapt from Cooper (1983); Rothaermel and Deeds (2004); Mayo (2014)

1. Idea generation - This is the brainstorming session which creates new idea for products.

2. Idea screening - All new product ideas are considered the possibility, in term of manufacturing, technology and marketing capability, to develop those products. The least successful idea is eliminated from this stage.

3. Concept development and testing - New product ideas are conducted the marketing research in order to understand consumer's insight. The low evaluation scores are discarded or revised.

4. Business analysis stage - The new ideas are narrowed down. Profitability and manufacturing costs are analyzed. Throughout these four stages, the new idea has worked on paper with a relatively small investment.

5. Prototype development - In this stage, the concept is transformed into the actual products align with consumer's need.

6. Test Marketing - The concept and prototype are conducted the research again in order to get the feedback from consumer. Unaccepted products from the research are re-conceptualized.

7. Commercialization – This is the final stage that the product is introduced in full scale. The investment of timing for introduction, production, distribution channel or promotion is the crucial concern for manufacturer. (Mayo, 2014)

According to Cooper and Kleinschmidt (1986); Rochford and Rudelius (1997), presented 13 and 12 activities, respectively in their NPD process. The NPD process of 13 and 12 activities had the evaluation of firm current technology and verification of market stage and described more about the industrialization before product launching. However, other stage was similar to the flow in figure 1.

Lots of researcher tried to update their NPD process, the theory from International Journal of Business and Information; Millson (2012) explained that the key successful of new product development process is to understand consumer needs, perform design and manufacturing activities proficiently, close contacts with end users and develop effective NPD processes.

Some literature mentioned the general NPD model which combined among three types of activities; the environmental factor, marketing activities and

technical activities (Calantone and Benedetto, 1988; Suwannaporn and Speece, 2003). The main model was shown in figure 2.2 This model combined Idea generation and idea screening to be screening stage and combined Concept and Prototype development to be product development because they were the continuous process which should be combine in one stage. Moreover, market introduction was the most important part for new product development. Hence, it was a separate step of this model.



Figure 2.2 The six general model of new product development process

Sources: Adapt from Calantone & Benedetto (1988)

Different industries provided different NPD process because they have different concern. For example, the concept framework of new internet and search engine application from Bilgram et al. (2008). They created lead user method as a tool for idea generation and conceptualization which came from two phases as shown in figure 2.3. Whereas, customer-oriented approaches in later phase came later on because basically innovative product is the leading edge of significant trends in the market.



Figure 2.3 The concept framework of new internet and search engine application

Sources: Adapt from Bilgram et al. (2010)

For the electronic manufacturing companies, Salgado et al. (2003) analyzed and considered the suitable NPD process which was divided into five phases as shown in figure 2.4. This model was proved to utilize by the three Brazilian research and development (R&D) experts who graduated in electrical engineering.

This model focus on the product design therefore the three main parts came from product designs.



Figure 2.4 The model of new product development in the electronic manufacturing company

Sources: Adapt from Salgado et al. (2003)

2.3 New product development process for food and beverage industry

The model of food product development process was difficult to define. Basically, it began with the concept and end with either the new products or the existing products (Rudolph, 1995)

Therefore, the Arthur D little, Inc. developed milestone-driven product development process which this process was easy to adapt in many NPD products, especially food and beverage industry.

The total milestone of food and beverage development process was shown in figure 2.5. This process was divided into three phases; product definition, product implementation and product introduction.

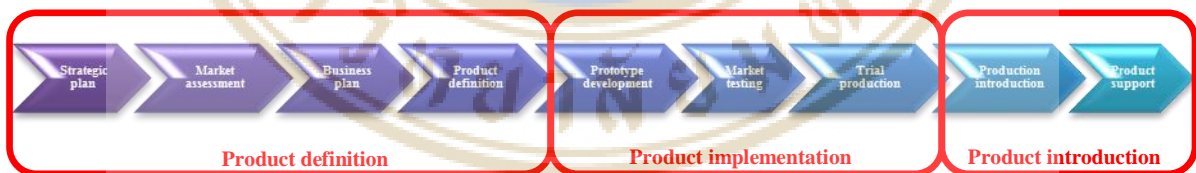


Figure 2.5 The milestone of food product development process

Sources: Adapt from Rudolph (1995)

This milestone started from *strategic plan* which a major output of this step was a vision of company’s direction, marketing positioning, company’s core competency, regulation and profitability targets. Next step is *market opportunity assessment*. The team had to conduct consumer research which led to market opportunity. After that, *the product business plan* would describe the market

opportunity and the program me required. The last step of product **definition phase** was *product definition* that came from consumer requirements, business objective, product delivery requirements and product safety/regulation issues.

In term of **product implementation phase**, *Prototype development* was the first stage of this phase. The product should develop rely on business objectives. Then, *the market strategy and testing* would come later on. Marketing team had to forecast sale and conduct consumer research in order to get feedback from product trial. *Scale-up and trial production* was the one step to concern with a total quality program me that identify analyses and control risk.

The last phase was **product introduction and product support** both step were led by sale and supported by marketing site. Those stages were readied to launch and build product success from sales and marketing team (Rudolph, 1995)

In the research of knowledge and process management, Man et al., 2010 proposed idea funnel model which represented the new product development process in food industry.

This process started from *identify trend* from global or market situation. Then, *identify concept* which company should define consumptions method, preparation concept. After that, *filter* the concept by evaluating in the context of company's image. *The entry mode*, was the stage that company has already list the criteria to for NPD product, came later on. *The production and launching process* would come after all stages complete. The model was shown in figure 2.6

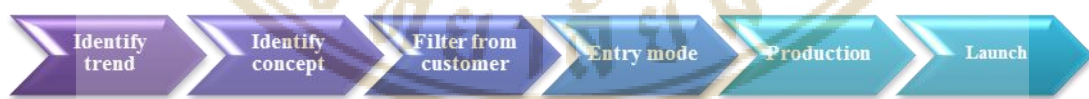


Figure 2.6 The model of new product innovation for food industry
Sources: Adapt from Man et al. (2010)

2.4 New product development process for Thailand's food and beverage industry.

Several food journals (Suwannaporn and Speece, 2000; 2008; 2010) addressed that new product development process in Thailand's food and beverage industry was similar in term of major process.

The International Food and Agribusiness Management Review, Suwannaporn and Speece (1998) stated that the approach of NPD process in Thailand's food and beverage industry was classified in three categories;

- *New product line* -The new product in the company which might or might not have new in the market. This type was considered more risky than other NPD because of high investment for implementation. Hence, top management or senior marketing managers in Thai company normally made decision based on their experience and rough analysis (Not concern the marketing research) to get their intuition for the market.

- *Additions to existing product lines* - A company used existing process to produce the product. The product might or might not new in the market.

- *Modifications of existing products* - The product had more varieties of taste, flavor, form, content and packaging in the same concept.

NPD for *Additions and Modification to existing product lines* is usually less risky. Both types could use existing process with little adjustment. Top management do not involve in both types which normally idea would come from marketing and R&D team by relying on customer's satisfaction.

Moreover, Manufacturing approached in food and beverage company occurred with the OEM production which the company itself had facilities to produce the other's company product. Therefore, the idea generation had to come from customers who hired the company.

CHAPTER III

RESEARCH METHODOLOGY

3.1 Methodology

This research is conducted to gather information from Research and Development (R&D) officers who used to work at least two model of the new product development for food and beverage in Thailand. This group is chosen because the main responsibility of R&D is to develop the new prototype (Suwannaporn and Speece, 2010) which they need to cooperate with both marketing department and manufacturing department. Therefore, they need to understand the whole process of new product development. In addition, R&D team normally tries to deeply study for prototype development in order to meet with consumer's requirement and be practical way for production process as well. Furthermore, R&D team normally conducts the new product feasibility study which sometime that product needs to be stopped due to business situation. Thus, R&D have lots of experience for NPD process when compare to manufacturing team.

3.2 Sample size and data collection

Qualitative research has been adopted in the study in order to provide emphasize understanding the different approach can affect the outcome of new product development, some stage of NPD process decrease the quality of the new product and summarize the general flow of NPD process for Thailand's food and beverage industry. Besides, this research would like to enrich the insight of using each NPD process toward four years' experience of R&D persons. This research approach is mainly based on semi-structured interviews. By this method, it will help to explore the approach of NPD process; advantage and disadvantage of each approach, the most important stage that cannot be removed and the stage which should be improved, the general process of Thailand's food and beverage product and answer questions by analyzing from the interview. To collect data, the research focuses on 5 R&D officers

from large food and beverage enterprises in Thailand, particularly have an experience at least two NPD processes in order to compare the different between two approach of NPD processes. Table 3.1 presented the personal's background of selected R&D.

Table 3.1 Summary of data collection

	Research and development position				
	A	B	C	D	E
Industry	Food&Beverage	Food&Beverage	Food&Beverage	Food&Beverage	Food&Beverage
Main product	Frozen&Chill food	Alcohol drink	Fruit juice	Seasoning&Coffee	Seasoning&Coffee
OEM factory	Y	N	Y	N	N
Working time	7 years	4 years	7 years	11 years	8 years
Interview date	30-Oct-14	1-Nov-14	1-Nov-14	3-Nov-14	4-Nov-14
Interview Time	17.30-18.30	17.00-17.40	17.50-18.30	17.00-17.40	17.50-18.30

Since most food and beverages company in Thailand have lots of new product launching (SCB Economic Intelligence Center, 2013), they definitely encounter with many challenge during working on each process. The interviewees can help to recommend which approach is suitable for which NPD and also the general model for product development.

In this step, the researcher will use an in-depth interview because we can get an accurate and distinct respondent's experience without limitation in alternative. Open-ended questions are used because researcher would like to understand "How" and "Why" questions. Moreover, the research would like to encourage respondents to spread their opinions freely. Information regards to R&D officer's experience are normally derived from semi-structured interview (Ghauri & Gronhaug, 2002). All interviews are conducted by the same researcher to control external variables.

CHAPTER IV

DATA ANALYSIS

4.1 Interview Summary of each company

In this chapter, the results are presented into two parts. The first one is to describe the interview summary. The second one is to compare the differences and similarities in order to define the finding among R&Ds from each firm.

4.1.1 Person A

Person A, works for Ajinomoto (Thailand) company as a R&D supervisor, who used to work for CPF Company in the same position. She would describe NPD process of CPF Company which she had worked for seven years. The main product of CPF Company is frozen food, chill food ham and sausage that sell both domestic and export market.

In term of NPD process, she mentioned that her company's new product was developed around 3-6 months depend on how complicated it was. She stated that her company's NPD process was quite the same. The difference came from *the input information* that there are three types in her company; marketing approach, customer approach and management approach. The next step of input information would be *finding target quality*. Marketing and Management approach, they would request R&D team to join restaurant survey or asked for the chef to cook the menu they wanted and defined the target quality together. For the customer, they normally came with the sample or they asked R&D to develop for them but they had already had their target quality. Then, they moved to *product development stage* and *asked for sample approval*. After that, *test in the production line, prepare the document* and moved to *the production line*. The models were shown in figure 4.1



Figure 4.1 The NPD model of CPF Company in different approach

According to their different approach, marketing team would have some consumer research or do some data about the market. They usually designed the interesting product or target in each category and gave information to R&D team. For the top management, they normally just told the product they wanted. Some product could not find the right market in Thailand that meant sometime the product just only developed but it didn't launch in the market. For the customer, they have the target already therefore the product is quite clear. They normally came with the sample.

The advantage and disadvantage of each approach, First of all, marketing approach; they had already analyzed the market and also product. Thus, R&D team would get the clear direction. Whereas, it took long time to conduct the research and verify their understanding with consumer. As from the long time, sometime the product was not verified with the market which it was risky whether that product might go well in the market or not. Second, management approach, she said that her team could develop product very fast due to the pressure from management team which they could get a lot of new products. On the other hand, some product was not clear market. The product came from their perceiving that did not base on consumer's need. Finally, it was terminated new products. From this situation, the company might lose time and money for the failure. Thirdly, customer approach, the advantage was the product should be developed very fast because customer provided clear target direction. However, as an OEM, developing this kind of product could not create new

innovative things in to the company. R&D team did everything base on customer's requirement.

From her perspective, the most difficult part in NPD process was to find the right target and how to develop the product with reasonable price and meet with target quality. CPF itself, they didn't concern about cost at the first time they launched. Even though it was lost, they still produce it because they got the profit from their total sale. The easiest one was to prepare the document because everything was ready to transfer to the production. She said it was like routine work. From the process, the most important part was target quality which defined the direction for development. The important point that should improve in her company was input information from management that they should consider market possibility before requesting the support from R&D team. She addressed that if her team develop new product with no market, at the end, the product itself had to terminate. Another improvement was product approval. In her company, the evaluation based on the top management acceptant which they were not the target quality. The reason made some product in her company was not successful in the market. Her company should conduct the research in order to confirm the product before launching.

Lastly, her company verified her NPD processes from call center and sale information so that they can know the consumer's feedback. If sale did not go very well in the market, they would adjust/re-evaluate the process again and they would go back to review the market. As from her company, only popular product was re-evaluated. For the new product, if it did not go well, they would terminate it as her mention. She also stated that knowing consumer's insight differentiated her company from the competitor. We could see the product like frozen and chill food that they were the first company to produce and let other realized it.

4.1.2 Person B

Person B works for Boonrawd Brewery Company as a R&D officer, which he used to work as a production officer and R&D officer in the second company. He started to describe the product in his existing company which divided into three categories; Beer and liquor were the first one. Beverage with non-alcohol as water,

functional drink (Being brand) and sport drink in the second one and lastly, food as seaweed in the masita brand.

In term of NPD process, he mentioned that his company's new product was developed about one year which there were two NPD processes in his company. The NPD processes had to start from *input from marketing and top management*. In term of marketing, they always search product from oversea and market trend. For the top management, they just only told R&D team to develop the product they wanted. The next step is the same process. After R&D team has got the information, they had to *develop the product* and conduct the marketing research later on in order to *verify the product*. If the product did not overcome their criteria, they would develop the product to make it better. Then, *the product trial* was the next step after get approval from the verification. After finishing production process, they would *launch the new product into the market*. The models were shown in figure 4.2



Figure 4.2 The NPD model of Boonrawd Brewery Company in different approach

The advantage and disadvantage of each approach, First of all, top management approach, he mentioned that every step, that his team did, was always fast because of top management's request. On the other hand, this approach could not provide clear objective. R&D team might need long time to develop and create good quality. In term of marketing approach, the objective of NPD was very clear because they got the real information from market trend. However, sometime R&D team had to hold the new product due to market change and marketing would propose the new product for development.

For his perspective, for the NPD process, the most difficult part was input information from the top management. Sometime they put the idea but they did not provide the direction which R&D team needed to search new technology on their own. Sometime their company did not have facility to do which make them to develop the new thing. This might be one of the advantages as well. In term of the easiest part, the development process because he was in chart in this field that why he thought it was quite easy when compare to other steps. He mentioned that the most important part in NPD process was the development process whether the product was good or not. It would come from the development. If he develop product without the deliciousness, no one would eat it. He addressed that he would like to adjust the input information because R&D team should know the possibility of the products if the direction was not clear. It might help R&D team to fasten their NPD.

Additionally, his company verified the NPD process from sale situation. If the sale of each product was not good enough, they basically tried to find out what stage/step they did wrong and they fixed them to create better quality. In his opinion, development stage could differentiate his company's product from the competitor. He was confident that his company had high facility in term of Laboratory.

4.1.3 Person C

Person C works for Nuboon Company as a R&D officer about four years. The main product of Nuboon Company is fruit juice (Smile brand) as orange and coconut juice.

In term of NPD process, he addressed that it was taken from three months to one year for new product development that his company had three different processes. These processes would start from marketing, customer and R&D team information. After that they *researched the data* such as ingredient, know-how and regulation. Then, they moved to development stage by matching with their processing line. After passing this step, they would *make the prototype* and approve by consumer or marketing team. Then, *product testing* was the next step which he breaks down into four parts such as sensory evaluation, product testing, packing test and market survey. After passing these steps, they conducted *trial run* and verify the product again. The detail of verification was deep study in term of product specification such sensory

evaluation, shelf life test. Then, they fine adjusted the process for *first production and launching*. The models were shown in figure 4.3



Figure 4.3 The NPD model of Nuboon Company in different approach

The advantage and disadvantage of each approach, firstly from marketing approach, the advantage was marketing team in his company had fast action when the company conducted the research or request the approval. On the other hand, sometime marketing team did not clarify the direction to R&D team. For customer approach, the advantage was to use less time to research the data because they could get the idea and data from customer. However, sometime his company didn't have facility to serve customer's need. For R&D team approach, he stated that his team had opportunity to create innovative product, every idea from R&D could make the product. This was the advantage. While disadvantage was some idea could not sell to the customer. From his point of view, the difficult part of NPD process was product testing (Shelf life and stability test) because his team must find the way or method to test the product. This step was very difficult to verify the process. It might say that the product testing was the most difficult one. The easiest part was the step of making prototype because it was the step in the lab scale. He mentioned that the most important part of NPD process was the product testing for evaluating the stability of the product. It might help for further step. The part that he would like to adjust in his NPD processes was the development stage because his company did not have full facilities in the production line therefore he need more adjustment for production process.

Furthermore, he addressed about how to verify the NPD process. For the customer approach, the customer repeated his products again. In case of marketing and

R&D approach, his company had to verify by listening feedback from sale or customer. Lastly, the step that could differentiate his product from competitor was the first step or getting the idea from customer marketing and R&D team because if they have lots of data of market and description of the product such packaging material, target group, optimum size and trend or any important information, they could improve their product.

4.1.4 Person D

Person D is now working as a division manager at Ajinomoto (Thailand) company. She is in charge for product concept development which she is taking this position around three years from eleven years working for this company. Her company is famous for the seasoning products as MSG and Rosdee® (Multipurpose season) and also have new category which is Rosdee Menu™ (menu type seasoning). Moreover, the company was still famous in Birdy® can and also the 3 in 1 powder mix coffee.

In term of NPD process, her company developed the new product probably around one year in average. Some product was developed shorter or longer depend on product difficulty. Her NPD process was around two processes; firstly, *market lead process* and R&D or *technical lead process*. In term of market lead, it was seem like general process which many companies also have. The input would be from the market opportunity which the leader would be the marketer. They would research from the market growth or the categories they wanted to jump in. Then, they *extracted the idea together with the R&D*. After that, they *get the product idea* and go to the *verification method* and pass through *the development and assessment*. The final stage was to *produce in the factory and launch*. Another process was quite similar flows; it was just the input information that came from R&D lead. Since Ajinomoto company has the head quarter in Japan, they research many technologies therefore it was very good change. Her company could utilize the technical to be her product development. The model of NPD process was shown in figure 4.4



Figure 4.4 The NPD model of Ajinomoto Company in different approach from product concept team perspective

For the advantage and disadvantage, the market lead process, Marketer would be stickily researched base on market opportunity therefore the advantage obviously was about the business impact. For the disadvantage, sometime it was not sustainable because this approach normally followed the trend which if that trend had gone and marketing and R&D team could not catch up the trend well enough. Thus, the product would be terminated at the end. For the technical leads, the product could differentiate from the technology they put in the product which it could sustain in the market due to technology barrier. This was the advantage that competitor could not copy. On the other hand, product like this might not survive in the market because product with high technology also came up to high cost as well so it was difficult to sell to the market. Sometime some product advanced more than consumer's need so it was high possibility to fail in the market. This process took longer time when compared to the marketing lead because to research one material/one technology, it took more than one or two year which she stated that many company they might have research center in order to prepare for this in advance. For the difficulty of NPD process, there would be two steps; one for the information they got, how to get the right information, how to extract what kind of information would use to develop the product. Another part was the verification method, how to utilize proper method to verify whether the idea rely on their thinking way was good enough for launch in the market or not. The easiest part was development part. If R&D team got the clear direction and in this stage they had already had lots of information on hand, they could pick up information to get the new product in development stage. She mentioned that if her team got unclear information, it effected the period of NPD process. She stated that every step of NPD process was very important. If she wanted product to be successful, she thought she had to take care of every part. However, she would like to

improve the assessment part because in her company, there was lots of step for assessment which took two or three month to complete. Hence, if her team could manage the step effectively, the company could shorten the launching time. This led to the input information, if the target quality was clear; she mentioned that unnecessary might be cut.

The measurement of effective NPD process was divided by two parts; in the case of before product launch, if the total project was not delayed from time schedule, it might say that NPD process was still effective. While, the case of after launching, the success of the product in the market could verify the effectiveness of NPD process. Eventually, the technical input could make her company's product differentiate from competitor. She said that every company might focus on different technical approach and develop base on their technical knowledge in order to create unique product from competitor.

4.1.5 Person E

Person E now current works for Ajinomoto (Thailand) company in the part of product design for the new business for Ajinomoto (Thailand). In the part, she used to work for many products in the part of concept development under the brand of Ajinomoto; Birdy® Rosdee® and Rosdee Menu® and several new products did not launch in the market. From that kind of concept development, she also had a change to work in the part of industrialization as a seasoning product. As she mention above, there are many range like coffee both ready to drink and 3 in 1 and also seasoning product; seasoning mix, seasoning with flour and also process food like instant jok.

In term of NPD process, the period for develop the new product depend on the difficulty of product itself and also the concept to be differentiated to others and the current technology what company had. Normally, it was about one and a half years or more. She said that considering the organization and business her company had two NPD processes. There would be separated by *current business* of Ajinomoto (Thailand) company and another one of the *new business categories* for her company which the way to develop was a bit different because if current business, R&D team develop based on current business that they had whether current co-manufacturer or in-house production. In case of the new business, that one was no range of factory or

production size. It could be import from Ajinomoto group like in The Philippine and Japan and then they would bring the concept to Thailand or otherwise they could use current factory but it produced another format to be sale in the market. The process to develop these two approaches in general, it would start from *business strategy creation* both marketing and R&D team or sometime they had top down management from management to set business strategy for midterm and long term. Then, it came up to evaluate the product which kind of product they would select and which kind of business they would like to invest. After the evaluation, they came up the one product category selection. Then, they did evaluate again. Under the product category, there are many kind of format. Then, using evaluation from market size, consumer insight, or technology and production or even the structure of cost simulation would select the product for the market. After, they could conclude what would be the product. Then, the step would be moved to *concept development*. Each product should have target occasion from consumer. Then they used that concept to generate the detail concept together with the technology in order to be unique selling point. Then, for the idea of the product concept, R&D would use that information to go to the laboratory to start for prototype development. That prototype would be *investigated and evaluated* with the target user according to inside's need. Then, they move to the *recipe development stage* which relies on the target quality. After that, R&D team try to input technology, adjust the raw material cost and try to match with their factory or OEM factory. Then, they would finalize the recipe in the laboratory and *verify again* with the consumer. There are many type of verification depend on type of product. If the product passed the evaluation, we would go upscale. The *up scaling* was like normal company. They had criteria and KPI to achieve. After that they would move on to *launching period*. In the meantime, Marketing had to do launching plan in order to create proposal for CVS or modern trade together with up scaling period. The models were shown in figure 4.5



Figure 4.5 The NPD model of Ajinomoto Company in different approach from product design for the new business

The advantage and disadvantage of current business was the company had some input on hand like inside customer because they basically focused on current user and current market that they knew and also had facility and know-how. The developed period was faster than new business. However, for disadvantage, sometime both R&D and marketing had stricken with the new idea that led to take long time for idea creation in order to differentiate the product from existing one. If they could not create the new unique products, the cannibalization might be occurred. On the other hand, for the new business, since they did not have know-how, production facility or even the customer, it surely led to take long time for strategy setting product categories selection especially product concept and technology feasibility. In term of the process, the most difficult part was business strategy and product strategy setting because there were many products which needed to have the criteria to be used for the evaluation or selection which right now management team would set and discuss before making the decision again. In term of the easiest part, she mentioned that recipe development was very easy because person in chart understood the target quality, target cost and limitation so it had the possibility to achieve the quality. In term of the most important part in her company, she stated that the product strategy played the key role of NPD. If they have not been clear strategy and target quality, other step would not go align with the strategy. At the end, it might need to rework many time.

To adjust the process, right now it had no need to do but the business strategy part should be strengthen because they mainly took in chart by experience members so it was not well established on the detail step. If it could be raise up on the many methods, it might be useful for it. In term of the verification process, if the product fit with consumer's need and sale was very well. She could assume that the

NPD process was successful. Lastly, to differentiate her product from competitor, she addressed that concept development, it could not be just statement but this step could understand consumer's inside to develop that concept, technology that had to create rely on the concept. Therefore, from this function the concept part should know and select only possible one. That why it was differentiate from the competitor.

4.2 Comparative analysis

According to the information from interviewing person A to E, the important issue can be 9 issues.

4.2.1 General flow of NPD process in Thailand's food and beverages industry depend on R&D perspective.

From the five research and development (R & D) staffs, there are many steps in NPD processes which are similar stage when compare among of processes. Therefore, it might summarize the general flow of NPD process as below figure.



Figure 4.6 The general NPD model from the perspective of five research and development staffs

4.2.2 Period of new product development process

“My company's new product is developed around 3-6 months depend on how complicated it is.” (Person A)

“My company's new product is developed about one year” (Person B)

“It is taken from three months to one year for new product development” (Person C)

“My company develops the new product probably around one year in average. Some product is developed shorter or longer depend on product difficulty” (Person D)

“The period for develop the new product depend on the difficulty of product itself and also the concept to be differentiated to others and the current technology what company had. Normally, it is about one and a half years or more.”
(Person E)

Most R&D staffs mention that it is taken around one year for new product development process however it depends on the characteristic of each product that might need less/more time for development.

4.2.3 Number of NPD process in Thailand’s food and beverages industry.

“There are three types of NPD process in my company; marketing approach, customer approach and management approach” (Person A)

“The NPD processes have to start from input from marketing and top management.” (Person B)

“These processes would start from marketing, customer and R&D team information.”(Person C)

“NPD process is around two processes. Firstly, processes are market lead process and R&D or technical lead process.” (Person D)

“Considering the organization and business, my company has two NPD processes. There would be separated by current business of Ajinomoto (Thailand) company and another one of the new business categories for my company” (Person E)

NPD process of Thailand’s food and beverage companies from five R&D staffs, there are basically three processes which consist of Top management approach, Marketing approach that can be divided into two parts; current business and new business categories and R&D approach. However, customer approach would include in case of that company have policy for OEM.

4.2.4 The difference of each approach for company’s new product development processes

“Marketing team usually designed the interesting product or target in each category and gave information to R&D team. For the top management, they normally just tell the product they wanted. For the customer, they have the target

already therefore the product is quite clear. They normally come with the sample”
(Person A)

“In term of marketing, they always search product from oversea and market trend. For the top management, they just only tell R&D team to develop the product they wanted.” (Person B)

“These processes would start from customer (OEM) marketing, and R&D team information.” (Person C)

“Firstly, market lead process and R&D or technical lead process. In term of market lead, it is seem like general process which many companies also have. The input would be from the market opportunity which the leader would be the marketer. They would research from the market growth or the categories they want to jump in. Another process is quite similar flow; it is just the input information that comes from R&D lead. Since Ajinomoto company has the head quarter in Japan, they research many technologies therefore it is very good chance for our company to utilize the technical to be our product development.” (Person D)

“There would be separated by current business, R&D team develop based on current business that they have whether current co-manufacturer or in-house production. In case of the new business, that one is no range of factory or production size. It could be imported from Ajinomoto group like in The Philippine and Japan and then they would bring the concept to Thailand or otherwise they could use current factory but it produce another format to be sold in the market.” (Person E)

From five R&D staffs, the first approach is Top management who do not have any direction for NPD product. They might use their experience to justify the concept of NPD. Secondly, marketing approach, both current and new business, they always provide the information because their ideas come from the research. In addition, they have obvious direction for R&D team. Thirdly, R&D approach, they try to propose technology for the NPD product in order to differentiate from competitor. Lastly, in case of OEM, Customers normally give the sample and clear direction which the company needs to follow their request step by step

4.2.5 The advantage and disadvantage of each approach for company's new product development processes

“First of all, marketing approach; they had already analyzed the market and also product. Thus, R&D team would get the clear direction but it takes long time to conduct the research and verify their understanding with consumer. Second, management approach, my team could develop product very fast due to the pressure from management team. On the other hand, some product is not clear market. Thirdly, customer approach, the advantage is the product should be developed very fast because customer provided clear target direction. However, as an OEM, developing this kind of product could not create new innovative things in to the company. R&D team did everything base on customer's requirement.” (Person A)

“First of all, top management approaches every step my team do, is always fast because of top management's request. On the other hand, this approach could not provide clear objective. In term of marketing approach, the objective of NPD is very clear because they get the real information from market trend. However, sometime R&D team has to hold the new product due to market change.” (Person B)

“The advantage and disadvantage of each approach, firstly, from marketing approach, marketing team have fast action when the company conduct the research or request the approval. On the other hand, sometime marketing team does not clarify the direction to R&D team. For customer approach, it is taken less time to research the data because they can get the idea and data from customer. However, sometime company does not have facility to serve customer's need. For R&D team approach, my team has opportunity to create innovative product. While disadvantage is some idea could not sell to the customer.” (Person C)

“The market lead process, Marketer would be stickily researched base on market opportunity therefore the advantage obviously is about the business impact. For the disadvantage, sometime it is not sustainable because this approach normally followed the trend which if that trend has gone and marketing and R&D team could not catch up the trend well enough. Thus, the product would be terminated at the end. For the technical leads, the product could differentiate from the technology they put in the product which it could sustain in the market due to technology barrier. On the other hand, product like this might not survive in the market because product with

high technology also came up to high cost as well so it is difficult to sell to the market.” (Person D)

“The advantage and disadvantage of current business is the company had some input on hand like inside customer because they basically focused on current user and current market that they knew and also had facility and know-how. The developed period was faster than new business. For disadvantage, sometime both R&D and marketing stick with the new idea that lead to take long time for idea creation in order to differentiate the product from existing one. On the other hand, for the new business, since they did not have know-how, production facility or even the customer, it surely led to take long time for strategy setting product categories selection especially product concept and technology feasibility.” (Person E)

There are both advantage and disadvantage of each NPD processes which base on 5 R&D staff’s perspective as followed in below table

Table 4.1 The advantage and disadvantage of different approach from five R&D staff’s perspective.

Type of approach	R&D's perspective	
	Advantage	Disadvantage
Top Management	- Use less time to develop product	- Not clear direction - Not answer consumer's need (Products)
Marketing	- Clear direction - Have data for tracking - Easy for current business	- Take time for consumer research - Follow trend, not differentiate product from competitor
R&D team	- New innovative idea (unique product) - Lots of know-how and learning	- High cost - Not ready for the market (overexpect from consumer's need)
Customer (If any)	- Clear target direction	- No new know-how - Follow consumer's requirement

4.2.6 The most difficult part of company’s new product development processes from R&D staff’s perspective.

“The most difficult part in NPD process is to find the right target and how to develop the product with reasonable price and meet with target quality. CPF itself, they didn’t concern about cost at the first time they launch. Even though it is lost, they still produce it because they get the profit from their total sale.” (Person A)

“The most difficult part is input information from the top management. Sometime they put the idea but they did not provide the direction which R&D team needs to search new technology on their own. Sometime their company does not have facility to do which make them to develop the new thing. This might be one of the advantages as well.” (Person B)

“The difficult part of NPD process was product testing (Shelf life and stability test) because my team must find the way or method to test the product. This step is very difficult to verify the process. It might say that the product testing was the most difficult one.” (Person C)

“For the difficulty of NPD process, there would be two steps; one for the information they got, how to get the right information, how to extract what kind of information would use to develop the product. Another part is the verification method, how to utilize proper method to verify whether the idea rely on their thinking way is good enough for launch in the market or not.” (Person D)

“The most difficult part is business strategy and product strategy setting because there are many products which need to have the criteria to be used for the evaluation or selection which right now management team would set and discuss before making the decision again” (Person E)

From five R&D officer's perspective, the most difficult part is the input information, not only from the top management, but also other approach because this step is the first step for further development. Therefore, if R&D team gets wrong information from the first step, the following step also change the concept from input information. Another step is the verification stage, some members show their opinion that how to select the best way to verify the idea for product creation which normally different product might use different method for verification.

4.2.7 The most important part and adjusted step of company's new product development processes from R&D staff's perspective

“The most important part is target quality which defined the direction for development. The important point that should improve is input information from management that they should consider market possibility before requesting the support from R&D team. If my team develop new product with no market, at the end,

the product itself have to terminate. The improvement point is product approval. The evaluation based on the top management acceptant which they are not the target quality. The reason makes some product in her company is not successful in the market. My company should conduct the research in order to confirm the product before launching.” (Person A)

“The most important part in NPD process is the development process whether the product is good or not. It would come from the development. If I develop product without the deliciousness, no one would eat it. I would like to adjust the input information because R&D team should know the possibility of the products if the direction was not clear. It might help R&D team to fasten their NPD.” (Person B)

“The most important part of NPD process is the product testing for evaluating the stability of the product. It might help for further step. The stage I would like to adjust in my NPD processes is the development stage because my company does not have full facilities in the production line therefore he need more adjustment for production process.” (Person C)

“Every step of NPD process is very important. If I want product to be successful, I had to take care of every part. However, I would like to improve the assessment part because in her company, there is lots of step for assessment which take two or three month to complete. Hence, if I could manage the step effectively, the company could shorten the launching time. This lead to the input information, if the target quality was clear; she mentioned that unnecessary might be cut.” (Person D)

“In term of the most important part in my company, the product strategy plays the key role of NPD. If they have not been clear strategy and target quality, other step would not go align with the strategy. At the end, it might need to rework many time. To adjust the process, right now it has no need to do but the business strategy part should be strengthen because they mainly take in chart by experience members so it is not well established on the detail step” (Person E)

Normally, the most important part from five R&D’s perspective is quite the same as the difficult part which is the clear input information and effective verification method because both step will lead to the right direction they would create new products which fit with consumer’s need. In term of step adjustment, it depends

on the problem of each company but input information and verification stage are the part that they think it should improve in order to strengthen their NPD process.

4.2.8 Effectiveness of company's new product development processes from each R&D staff's perspective

"My company verifies NPD processes from call center and sale information so that they can know the consumer's feedback. If sale does not go very well in the market, they will adjust/re-evaluate the process again and they will go back to review the market. As from my company, only popular product is re-evaluated. For the new product, if it does not go well, they will terminate it." (Person A)

"My company verifies the NPD process from sale situation. If the sale of each product is not good enough, they basically try to find out what stage/step they do wrong and they fix them to create better quality." (Person B)

"For the customer approach, the customer repeats our products again. In case of marketing and R&D approach, his company had to verify by listening feedback from sale or customer." (Person C)

"The measurement of effective NPD process is divided into two parts; in the case of before product launch, if the total project does not delay from time schedule, it might say that NPD process is still effective. While, the case of after launching, the success of the product in the market could verify the effectiveness of NPD process." (Person D)

If the products fit with consumer's need and sale is very well. I could assume that the NPD process is successful. (Person E)

All of R&D staffs verify the effectiveness of NPD process from sale performance and consumer's feedback because these two factors information can ensure the quality of NPD process whether it is still suitable for utilizing with the next product or not.

4.2.9 The key uniqueness of company's new product development processes from each R&D staff's perspective

"Knowing consumer's insight differentiates my company from the competitor. You can see the product like frozen and chill food that we are the first company to produce and let other realizes it." (Person A)

“Development stage could differentiate his company’s product from the competitor because company has high facility in term of Laboratory.” (Person B)

“The step that could differentiate his product from competitor was the first step or getting the idea from customer marketing and R&D team because if they have lots of data of market and description of the product such packaging material, target group, optimum size and trend or any important information, they could improve their product.” (Person C)

“The technical input could make her company’s products differentiate from competitor. Every company focuses on different technical approach and develop base on their technical knowledge in order to create unique product from competitor.” (Person D)

“To differentiate the product from competitor, concept development, it could not be just statement but this step could understand consumer’s inside to develop that concept, technology that had to create rely on the concept. Therefore, from this function the concept part should know and select only possible one. That why it is differentiate from the competitor.”(Person E)

As from each R&D staffs, the uniqueness of their process depend on their strength. Some answer shows that the technology’s base is the key point to differentiate their product from competitor. Some might be the familiarity of consumer’s insight can lead them to develop product followed consumer’s need. The other mentions the facility of product development is their key uniqueness.

The summary of interviews is shown in Table 4.2.

Issue	Person A	Person B	Person C	Person D	Person E																																																			
NPD process from Thailand's food and beverage industry																																																								
Period of NPD process	3-6 months	1 year	3 months to 1 years	1 year	1.5 years																																																			
Number of approach in NPD process	3 Approaches; Top management Marketing and Customer	2 Approaches; Top management and Marketing	3 Approaches; Marketing, R&D team and Customer	2 Approaches; Marketing and R&D team	2 Approaches; Current business and New business																																																			
The difference NPD of each approach	Management -> Don't have direction Marketing -> Have target and direction Customer -> Clear target direction	Management -> Tell the product they want Marketing -> Search product from market trend	Marketing -> Have target and direction R&D team -> Freely propose idea Customer -> Clear target direction	Marketing -> Have target and direction R&D team -> Freely propose idea	Current business -> Own facilities New business -> Request know-how from AJICO																																																			
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Type of approach	Advantage	Disadvantage																																																						
Marketing	- Fast action	- Sometime it's not clear direction to R&D team																																																						
R&D team	- Get innovative product	- Idea couldn't sell to customer																																																						
Customer (If any)	- Get clear idea and data from customer	- Don't have facility to serve customer																																																						
Type of approach	Advantage	Disadvantage																																																						
Marketing	- Impact business (Follow trend)	- Products isn't sustainable																																																						
R&D team	- Have technology basics	- High cost																																																						
Type of approach	Advantage	Disadvantage																																																						
Current business	- Fast development - Have facility & know-how	- Stick with the new idea																																																						
New business	- New learning for the company	- Take long time for strategy setting																																																						
The most difficult part	- Find the right target	- Find the clear input information	- The product testing	- Input information - Verification method	- Business and product strategy																																																			
The most important part and adjusted step	Important part -> Target quality Adjusted step -> Product approval	Important part -> Development process Adjusted step -> Input information	Important part -> Product testing Adjusted step -> Development process	Important part -> Every step Adjusted step -> Assessment	Important part -> Product strategy Adjusted step -> Product strategy																																																			
Effective measurement	- Sale information and consumer's feedback	- Sale situation	- Sale information and consumer's feedback	- Product launch on time - Sale information	- Sale information																																																			
The key uniqueness of NPD process	- Knowing consumer's insight	- Development stage due to high facility of laboratory	- Clear information gathering	- Technical input information	- Concept development (Consumer's insight)																																																			

Table 4.2 Summary of Interview





CHAPTER V

DISCUSSION AND CONCLUSION

From the findings through the interviews with R&D staffs, some significant issues presented in chapter 4 can be discussed in details in this chapter.

The findings through the interviews are summarized as follows.

- There are around seven step of NPD process which consists of *Input information, finding target quality, product development, verification, recipe development, production process and launching*. The process flow of each R&D staffs is similar. It might be more or less step depend on how new product they are.

- Normally, NPD process takes around one year from input information until product launching.

- The input information is the key factor which creates the different process.

- There are four input information from this study which is Management approach, Marketing approach, R&D approach and Customer approach. (For OEM company only)

- There is both advantage and disadvantage of different input information

Top management approach - It is very fast for product development due to pressure from them but they do not give any exactly direction they need.

Marketing approach - There are many information from consumer research/ situation and trend of product. However, product always does not differentiate from competitor.

R&D approach - The product comes from technology and know-how which is beneficial for company to have their uniqueness. On the other hand, product cost is high and consumer might not see its value.

Customer approach (OEM company) - The target direction is clear but development team need to follow consumer's requirement therefore it has no new experience from this products.

- The input information and effective verification are the crucial part which all R&D staffs mention that they are very difficult and need to be improved at the same time because both parts derive from the communication which gets wrong information easily. Thus, Team need to make clear understanding between top management and R&D team, marketing and R&D team, customer and R&D team together with consumer and company from product verification.

- All R&D staffs believe that if input information and effective verification are improved, it could improve the effectiveness of their NPD process and their new product as well.

- All R&D staffs would verify the effectiveness from consumer's feedback and sale performance because they come from our target consumers which reflect our product/ process's problem.

- Each company has different uniqueness in term of stage in NPD process which is depend on strategy each company. For all of these, management team are the one who is responsible for finding their core competency of NPD process and try to strengthen it because the NPD general process is same but the differentiation should come from the detail of each stage/step which can create uniqueness of each product in the market.

As point out in the introduction session and literature review, some issue conform to my assumption and while some are different.

The main difference is the NPD process should be different in term of step/stage of each process. Whereas, the NPD process is the same, only input information is different. This result is the first different from my assumption

From the interview, the factor which creates the different approach might come from the type of product. As from the literature review, there are four types which in the food and beverage industry, there are only product improvement, Existing product with new market platforms, new product platforms and Innovative products (Introduction to project management, 2011)

In term of top management approach, it might be the new product platform because top management might see the potential in oversea and would like to extend the product categories to the company. For the marketing approach, there are three types of product that cover this approach, which is product improvement, Existing

product with new market platforms, new product platforms, because the main responsibility of this team is to lead the NPD process, coordinate, integrate and pursue the new product idea together with provide consumer's need to technical team (Bingham, 1992). While for the R&D approach, the type of product is innovative products which come from the technical knowledge that their team have.

Another difference from my assumption and the literature review is the function of development team which is divided into three teams; Top management, Marketing and technical team (Anderson, 2008). They also have separate responsibility which the input information should be the marketing team who propose top management and transfer information to R&D team. However, from this research, three teams could propose their new idea for NPD which can show the different style from each of them. For example, the top management team who has many experiences from the business, they use the gut feeling to propose the new product. The marketing that has lots of consumer's research and statistic data in term of market, they basically convince other department from their information on hand. The R&D team, who generally focus on the technology and company's know-how, always proposes product with high technology's barrier.

According to the step/stage adjustment, there is no literature review or the measurement to suggest that which process or step should be adjusted or improved because this issue might depend on each industry and also each firm who need to use their experience to monitor and verify by itself. Nevertheless, from the interview most R&D staffs mentioned in the same direction that they would like to improve the input information in order to reduce it disadvantage and verification step which should be effective and ensure that product will survive and sustain in the market.

CHAPTER VI

LIMITATION AND RECOMMENDATION

Due to confidential data of company's NPD process, the data collection activity of this research show the less number of companies and R&D staffs. There are only four company with five R&D staffs were accepted to the interviews request. Additionally, the limited time to conduct the research would be a major problem.

Besides the confidential data and limited time, the following are the limitations and recommendation

6.1 Limitations

The limitation of this research may result from the following issues:

- The information from data collection limits only the big company which can represent only some aspect. The SME and family business may create other perspectives which might be a big issue to change the conclusion of this research because different type of company even in the same industry might have different concern.
- The information from respondents cannot be proved whether it is right or not. The researcher needs to follow only the data that the respondents provided during the interview.

6.2 Recommendation

Increasing the number of both company and R&D staff should be focused in order to create the accuracy of this research. In addition, the respondent expansion to SME and family business in the same industries would be beneficial to gather the different perspective and come up to different result or guarantee the current result of Food and Beverage Company's NPD process

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APPENDICES

APPENDIX A: Interview Guides

The interview questions are related with the different approach of new product development in Thailand's food & beverage industry. The question guidelines are as following:

Name..... **Position**.....

Company's name.....

Question:

Screening question:

- Could you describe your work experience?
- Have you ever develop new product in different process?
- How many processes did you use to conduct in your new product development?

Main question:

1. What kind of products is in your company (Current Company)?
2. How long does it take when developing the new product in your company? (Average)
3. How many new product development flows in your company?
4. Please elaborate your company's new product development processes?
5. What is the difference of your company's new product development processes? Please explain in detail
6. From your perspective, what are the advantage and disadvantage of each process?
7. Which part of your new product development process are the most difficult part and easiest part? And why?
8. Which part is the most important part (Can't cut that part) in your new product development flow? And why?
9. Suppose you can adjust the new product development flow, which part do you want to do? And why?

10. How do you verify the step, that it is still effective, of new product development process?
11. What do you think which step can differentiate your product from competitors?

